



## SIERRA NEVADA RESEARCH INSTITUTE

This year has seen continued accomplishments by the faculty and researchers of the Sierra Nevada Research Institute. This newsletter highlights some of their awards, research and successes. It is an extraordinary privilege to be working at this University at this moment in California's history. The challenges and questions raised at this confluence of natural systems, agriculture and human activity present incredible opportunities for discoveries and new knowledge which holds great promise for the region and the world.

The first 5-year review of the SNRI was submitted this spring. SNRI, created in 2001, became the first ORU (Organized Research Unit) at UC Merced in 2007. Additionally, this year, SNRI Faculty and researchers held a successful Research Week Seminar, delivered a well-attended Climate Workshop, sponsored and organized a Solar Symposium in San Francisco and as you will see in this newsletter, have kept a busy calendar of successful efforts in 2015/16.

We invite you to keep abreast of the SNRI activities by visiting our website or giving us a call. Feel free to contact us if we can be of service, or if you have any questions about our research and programs. We hope you are able to support the important work of this team of scientists and look forward to seeing you – on campus, in the field or in your town.

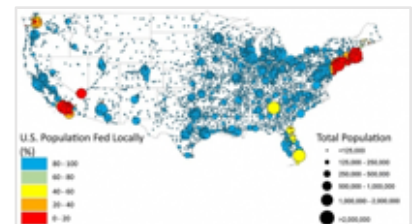
*Roger Bales*

Sierra Nevada Research Institute

# SNRI Newsletter

## Spring/Summer 2016

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Edited by:

Armando Quintero

## Greenhouses Coming to UC Merced

Sometime this summer, ground will be broken on the construction of two interim research greenhouses. The structures will be sited just north of the LeGrand parking lot within easy walking distance of the Science and Engineering Buildings. Each will provide 648 square feet of growing space for plant and soil experiments. Such facilities have long been a priority for SNRI and Life and Environmental Sciences. To purchase the two greenhouses and the necessary equipment for them, at a cost of around \$20,000, Dean Juan Meza of School of Natural Science has found funding for construction and utility hook-ups. The space will be used to primarily for faculty and student research, but at times will also provide space for extracurricular projects and propagation of plant material for lab courses.

Scheduling will be arranged through a portal on the SNRI website. Some of the first projects will involve growing pine seedlings: Dr. Emily Moran hopes to conduct a pilot study on the genetics of drought tolerance in ponderosa pine, while Dr. Carolin Frank is examining the role of



symbiotic bacteria in pine needles. However, future projects are likely to include investigation of traits involved in range limits in *Mimulus*, plant-soil interactions, and more.

The 2020 Project requirements include in the program a 2,500 sq. ft. research greenhouse and in addition a site has been identified as a 'master plan only' program element for a 17,500 sq. ft. production greenhouse. Stay tuned as we begin this new adventure on campus!

<http://www.greenhousemegastore.com/product/northern-starter-package/school-greenhouses>

### Dr. Marc Beutel



Dr. Marc Beutel received a 2016 UC Water seed grant for work with Stephanie Carlson and Jay Lund on "Hedging for Flow and Temperature Operation of Reservoirs for Fish during Drought."

### SNRI 5-Year Review!

Is now available on the SNRI website. It is anticipated that the SNRI will undergo an external review by faculty members from other UC Campuses this Fall. Stay tuned.



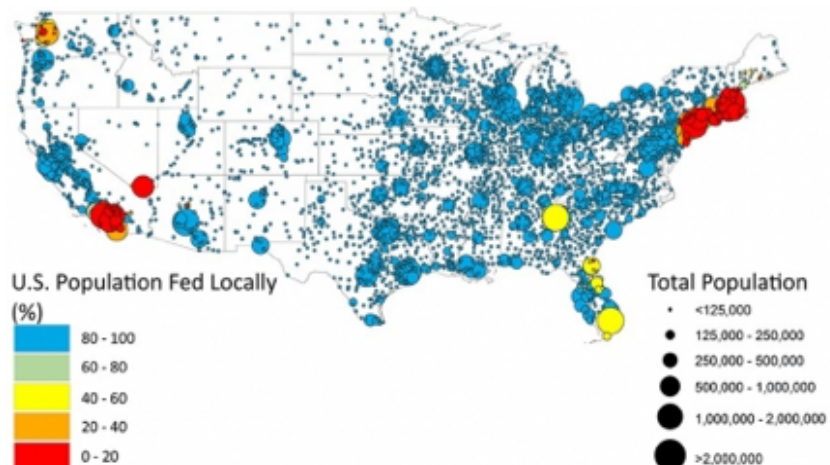
### Welcome Dr. Nicola Lercari



Dr. Nicola Lercari is our newest SNRI Faculty. Check out his SNRI profile to learn more about him.

<http://snri.ucmerced.edu/content/nicola-lercari>





## Elliott Campbell

There was a great deal of buzz last spring when a farmland mapping project by a UC Merced professor indicated that “most areas of the country could feed between 80 percent and 100 percent of their populations with food grown or raised within 50 miles.”

That researcher was Elliott Campbell. His research study – “The Large Potential of Local Croplands to Meet Food Demand in the United States” – appeared as the cover story of *Frontiers in Ecology and the Environment*, the journal of the Ecological Society of America (the largest organization of professional ecologists, with a membership of more than 10,000 scientists). The study immediately generated comment, including positive accolades from author and influencer Michael Pollan (UC Berkley professor). Many have noted the importance of the study in filling a research gap about local food.

## UC Merced shares in Three of Four UCOP Catalyst Grants

SNRI Affiliate Professors Asmeret Asefaw Berhe, Michael Dawson, Teamrat Ghezzehei and Jason Sexton, with the Life and Environmental Sciences Unit in the School of Natural Sciences, and Professor Nicola Lercari (the most recent SNRI affiliate faculty member), with the School of Social Sciences, Humanities and Arts, will collaborate with principal investigators at other UC campuses to advance knowledge about protecting biodiversity; enhancing agricultural resilience in times of drought; and preserving cultural heritage sites in the Middle East. The four winning projects were chosen from a pool of more than 180 proposals.



## Congratulations Professor Beman

Michael Beman was named the 13th faculty member from UC Merced to win the National Science Foundation (NSF) Faculty Early Career Development (CAREER) award. The award is close to \$700,000 to be used over the next five years toward his oceanic hypoxic and anoxic “dead zones”.



The Beman Lab work on manipulating oxygen levels in water and look at whether the microbes accelerate or slow the loss of oxygen in the water. Part of the project will also include two month-long trips aboard a research ship off the coast of Mexico to study the large and expanding deep Pacific low-oxygen zone. Beman said graduate and undergraduate students will be able to go, and, possibly, some K-12 science teachers from the Merced area. He hopes for a place aboard the Scripps Institution of Oceanography’s newest research ship, the R/V Sally Ride, named after the late astronaut.

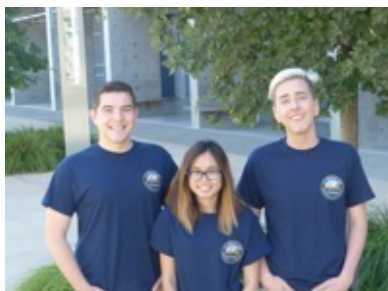
CAREER awards are given to junior faculty members who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Beman said the CAREER award is an honor that allows him to tackle a complex subject in depth because some problems simply take more time to solve.

## SNRI Office Staff



A very special thank you goes out to our amazing and dedicated staff in the SNRI office. Coty, Alexis, Crystal, and Mekenna continue to support our efforts. Working together, this group is critical to our collective and individual success. The office continues to maintain grants, personnel, expenditures and other research administration.

Follow up with Coty Ventura regarding new programs that you would like to have supported through the office. Armando is now also supporting faculty in their pre-award grant applications and is working closely with SPO and the RDS staff as this work load continues to increase.



Our student staff are Andre, Andres, Andrew, Patrick, and Vinke. These assistants allow an ease of daily operations in SNRI by providing support in the form of a variety of tasks. They came from a variety of disciplines around campus that help add to the diversity of our organization: Environmental Science, Chemistry, and Engineering.

Three of our students (Andrew, Patrick, and Vinke) received their degrees in the Spring semester commencement. Congratulations and good luck to your bright futures.

**Thank you for your support and dedication!**

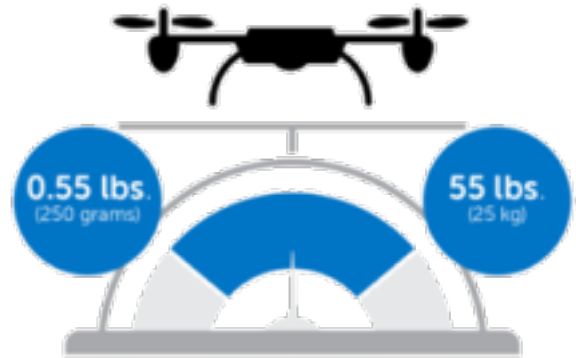
### STOP BY

Visit our office, we are here for you!

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## UC Center of Excellence on Unmanned Aerial System Safety

UCOP's Risk Services Division has created and funded the Center of Excellence on Unmanned Aerial System Safety. We will have a website up shortly that will provide information about the requirements for use and operation of UC-owned UAS's. We will send out a separate notice about the url for that site as soon as it is up and running. We are very pleased to introduce Brandon Stark (a graduate student of Dr. Yang Quan Chen), Lab Manager for the Mechatronics, Embedded Systems and Automation Lab in the School of Engineering at UC Merced, who will be leading the formation of the **UC Center of Excellence on Unmanned Aerial System Safety**. Brandon has agreed to serve as the system wide advisor with regard to drone use under the Section 333 authorization.



Professor Michael Dawson and one of his Grad Students are in a National Geographic article on seastars. See it here:

[National Geographic](#)



## Update from Dr. Jessica Blois

After almost three years at UC Merced, with two postdocs, four graduate students, and many undergraduate students doing exciting work in the lab, our research descriptions were a bit outdated. A major fall project for me and the lab has been to update the descriptions of what we



do, and it's finally (mostly) done! This was also a good chance for me to reflect on the research going on in my lab- and realize, again, how exciting it all is! We are working on paleo-modeling projects, community assembly and range shift projects, traits, genetic diversity and phylogeography, and basic natural history. I can't think of a more ideal set of intellectually exciting topics to work on. And, I have been fortunate to have attracted an absolutely fantastic set of people to work with me at UC Merced, in addition to wonderful collaborators at UCM and elsewhere. So check out our new research descriptions!



## UC Merced's Water Supply Forecasting Informs State's Decisions: SNRI faculty at the core of UC Water research and outreach

Leigh Bernacchi, UC Water Program Coordinator



In early June, 42 water researchers from across the University of California system convened in Santa Cruz with the aim of addressing California's water research needs. UC Water's annual retreat was an opportunity to reflect on past research accomplishments and plan for the next steps.

The UC Water Security and Sustainability Research Initiative started with six faculty, three from UC Merced, last year and has grown into a recognizable and responsive multi-campus research initiative. The network of water researchers approach each water problem from three angles: information and accounting needs, effective and fair institutions to manage the water resources, and encouraging smart investments in infrastructure, both "green" (river and floodplain restoration, forest health) and "grey" (for example, solar panels to reduce evaporation off of canals).



The foundations of UC Water's information system have been developed over a decade through partnerships with the Southern Sierra Critical Zone Observatory and the Sierra Nevada Research Institute. But the new integrative approach opens doors to understanding how much water we really have. Prof. Martha Conklin said that "UC Water makes the whole water system model possible." As one of UC Water's major cross-campus collaborative projects, scientists are linking high Sierra Nevada snow monitoring to stream gages and reservoir outputs through models which will enable sustainable groundwater management, storage and recharge.



In the next year, the holistic watershed accounting proof-of-concept will be shared with key water decision-makers at the regional and state scales. SNRI/UC Water faculty, post-docs and graduate students will continue to contribute to making research useful through workshops and news articles, ensuring good research gets in the right hands.

Keep up with UC Water on twitter (@ucwater) and online (ucwater.org).

## SNRI - [SCE Graduate Student Fellowships](#) available

To date, Southern California Edison has contributed over \$1 million in support of UC Merced programs, undergraduate scholarships and graduate fellowships at UC Merced.

This year a \$75,000 gift was given to support the STEM Ph.D. students pursuing research in the areas of water, energy and/or the environment. These areas may include, but are not limited to, the research focus areas of Sierra Nevada Research Institute.

These graduate fellowships are intended to continue to fund research focused on improving the prediction of water supply in the Southern Sierra Nevada watersheds. Projects include making more accurate snow/moisture measurements, understanding the effects of forest thinning on water supply, and understanding the changes in available water with a shift in precipitation at different elevations in the Sierra.

The link to this announcement will be posted here and on the SNRI website banner in the near future. The fellowship application opens on August 1st and review of applications will begin on August 8, 2016. Priority will be given to students who apply by that date, including their letters of recommendation.



## Climate Feedback: A guide to reliable climate news

-Emmanuel Vincent



Climate Feedback is bringing together scientists from around the world to sort fact from fiction in mainstream media coverage of climate change, helping the public know which climate news to trust. We also provide feedback for journalists and editors to help improve their accuracy and increase the visibility of the most reliable media sources.

But this is only a hint of what Climate Feedback can achieve. We want to increase the frequency of our analyses and aggregate scientists' comments and ratings into an index that rates the major news sources on their reporting of climate change. We call it the Scientific Trust Tracker.

We just reached our goal of \$30k thanks to your generous support! Because the campaign is successful, we are now In Demand on Indiegogo, which means you can still Stand with Science! All contributions above and beyond our original goal will go directly towards building a better website for Climate Feedback.



## Researchers Model Near Future of Coastal Redwoods' Habitat

Many species of trees and plants have begun migrating as the climate changes, but some, like California's giant coastal redwoods, can't just pick up and move.

By using California's historical climate data, UC Merced researchers have developed near-term predictions about the coastal habitat for the archetypal redwoods.



The trees will need to move north to keep up with the shifting climate.

"This method gets us over a hump that has been challenging climate modelers for many years," said Lara Kueppers, a researcher with the Sierra Nevada Research Institute and former professor in the School of Natural Sciences. "Usually, models use down-scaled global predictions, but the coastal climate is harder to predict because it's such a narrow strip of land that is strongly affected by the ocean."

<http://snri.ucmerced.edu/news/researchers-model-near-future-coastal-redwoods'-habitat>

## SNRI

Researchers

[snir.ucmerced.edu/researchers](http://snir.ucmerced.edu/researchers)

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Faculty

[snri.ucmerced.edu/faculty](http://snri.ucmerced.edu/faculty)

Students

[snri.ucmerced.edu/students](http://snri.ucmerced.edu/students)

### COMMUNITY ENGAGEMENT

We are very interested in exploring additional ways that SNRI staff and any additional resources that we have can help support your research. This includes vehicles, meetings, visitors, seminars, contacts, and other activities. Please reach out to Armando or Roger. Thanks.

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